



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Chao-Hsi Chuang, et al.

Serial No. 10/727,972

Filed: December 3, 2003

For: "Automatic Adjustment  
System for Source  
Current and ..."

Examiner: Rutland Wallis, M.

Art Unit: 2835

Our Ref: B-5314 621540-9

Date: July 31, 2006

RESPONSE

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

This paper is filed in response to the Official Action dated May 2, 2006.

Claim amendments begin on page 2 of this response. Applicant's  
remarks, which are made without prejudice, begin on page 7 of this response.

1. [Original] An automatic adjustment system for source current and sink current mismatch, comprising:

a startup compensation/setup device, to perform initialization current compensation and accordingly implement a control reference table;

a determination device, connected to the startup compensation/setup device through a second switch, to output a control signal according to the control reference table; and

a current compensation device, connected to the startup compensation/setup device through a first switch and to the determination device, to switch corresponding internal switches on and off according to the control signal and complete the desired compensation when the source current is the same as the sink current.

2. [Currently amended] The automatic adjustment system according to claim 1, wherein the first switch has a closed state during the initialization current compensation and an opened state after the initialization current compensation is completed.

3. [Currently amended] The automatic adjustment system according to claim 1, further comprising:

a transmission line, connecting the current compensation device to the startup compensation/setup device;

a series of at least one first constant current source and at least one third switch ~~switch~~, one end of the series connected to the transmission line and the other end connected to a positive voltage source;

a series of at least one second constant current source and at least one fourth switch ~~switch~~, one end of the series connected to the transmission line and the other end connected to a ground voltage.

4. [Original] The automatic adjustment system according to claim 1, wherein the startup compensation/setup device comprises a detecting resistor, an amplifier with negative terminal connected to the detecting resistor, an analog-to-digital converter connected in series to the amplifier, and a logic controller connected in series to the analog-to-digital converter.

5. [Original] The automatic adjustment system according to claim 1, wherein the determination device consists of a bandgap reference circuit, a comparator with negative terminal connected to the bandgap reference circuit, and a selector with two input terminals respectively connected to the comparator and the second switch and output terminal connected to the current compensation device.

6. [Original] An automatic adjustment system for source current and sink current mismatch, comprising:

a first compensation unit, having multiple circuits, each consisting of a first constant current source and a first compensation switch in which, for source current compensation, an input of the first constant current source is connected to a positive voltage source and an open terminal of the first compensation switch is connected to a transmission line;

a second compensation unit, having multiple circuits, each consisting of a second constant current source and a second compensation switch in which, for sink current compensation, an output of the second constant current source is connected to a ground voltage and an open terminal of the second compensation switch is connected to the transmission line, wherein the first and second compensation units form a railing configuration;

a first switch, having a joint terminal connected to the transmission line and an open terminal to be connected to the joint terminal to form a pathway when initialized and to be disconnected to the joint terminal to form an open circuit after initialization;

a detecting resistor, connected to the open terminal of the first switch, to detect source current and sink current mismatch;

an amplifier, having a positive input terminal, a negative input terminal, a first output terminal and a second output terminal, the positive input terminal connected to the open terminal of the first switch, the negative input terminal connected to a free end of the detecting resistor to compare current difference between two ends of the detecting resistor, wherein the largest and smallest differences are respectively output through the first and second output terminals;

an analog-to-digital converter, connected to the first and second output terminals of the amplifier, to convert the largest and smallest differences from analog to digital;

a logic controller, connected to the analog-to-digital converter, to set up a control reference table according to

the largest and smallest differences for required current compensation reference;

a second switch, having an open terminal and a joint terminal connected to the logic controller; and

a selector, connected to the open terminal of the second switch, to output a control signal according to the control reference table and a comparison value after the second switch is closed such that one or more circuits in the first or second compensation unit are turned on, thereby automatically performing current compensation to produce source current and sink current matching.

7. [Original] The automatic adjustment system according to claim 6, further comprising a low pass filter, connected to the transmission line and the joint terminal of the first switch, to filter unwanted signals and thus generate an output voltage.

8. [Original] The automatic adjustment system according to claim 7, wherein the selector further comprises a comparator, connected to the low pass filter, to receive the output voltage from the low pass filter, compare it to a reference voltage from an external bandgap reference circuit, and generate the comparison value.

9. [New] An automatic adjustment method for source current and sink current mismatch, comprising:

performing initialization current compensation and accordingly implement a control reference table;

outputting a control signal according to the control reference table;

determining whether to perform initialization current compensation according to the control signal; and

completing the desired compensation when the source current is the same as the sink current.